Valves

Controlling the operation of your clamping system requires the use of many specialized directional, pressure and flow control valves. Enerpac has the complete line of valving components to complement any hydraulic system. Choose from either manual or electric directional valves, and a wide variety of pressure control, flow control and specialty valves to provide the control and automation that your application needs.
<table>
<thead>
<tr>
<th>Modular directional valves</th>
<th>VP</th>
<th>122</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pressure switches, Flow control valve</td>
<td>PSCK VFC</td>
<td>123</td>
</tr>
<tr>
<td>Pressure reducing valve</td>
<td>PRV</td>
<td>124, 139</td>
</tr>
<tr>
<td>Tie rod kits, Remote/porting manifolds</td>
<td>TRK WM/PB</td>
<td>125</td>
</tr>
<tr>
<td>Solenoid valves, Inline check valve</td>
<td>VA, VS, VD</td>
<td>126</td>
</tr>
<tr>
<td>4-Way manual control valves</td>
<td>VMM VMT</td>
<td>127</td>
</tr>
<tr>
<td>DO3 Valves and accessories</td>
<td>VE</td>
<td>128</td>
</tr>
<tr>
<td>Valve manifolds</td>
<td>MB</td>
<td>129</td>
</tr>
<tr>
<td>Solenoid modular valves</td>
<td>VE</td>
<td>130 - 131</td>
</tr>
<tr>
<td>3-Way directional manual control valves</td>
<td>V</td>
<td>132 - 133</td>
</tr>
<tr>
<td>4-Way directional manual control valves</td>
<td>V</td>
<td>134 - 135</td>
</tr>
<tr>
<td>Sequence valves</td>
<td>MVP WVP, V</td>
<td>136</td>
</tr>
<tr>
<td>Pilot operated check valves</td>
<td>MV, V</td>
<td>137</td>
</tr>
<tr>
<td>Flow control valves</td>
<td>VFC</td>
<td>138</td>
</tr>
<tr>
<td>Accessory valves</td>
<td>MH, HV PLV, V</td>
<td>140 - 141</td>
</tr>
<tr>
<td>Air valves and accessories</td>
<td>VA, VR RFL</td>
<td>142 - 143</td>
</tr>
</tbody>
</table>
Solenoid directional valves

- Dual poppet valve design for zero internal leakage
- Inlet check-valve standard
- High cycle switching
- Stackable to 8 valve stations high
- 250-5000 psi operational pressure
- Oil flow capacity 427 in³/min @ 5000 psi
- Oil flow capacity 915 in³/min @ 0 psi
- G1/4" oil connections and integrated filtration
- Multiple voltage options

Options

- WM-10 series manifolds
- Tie rod kits

Pressure: 5000 psi
Max. Flow: 915 in³/min

Application

With the use of a -12 manifold, these valves allow quick and easy assembly of hydraulic control valves on your Enerpac ZW-series pump. For remote mounting of these valves use a WM-10 manifold.

Product selection

<table>
<thead>
<tr>
<th>Voltage @ current</th>
<th>Model number</th>
<th>Flow path</th>
<th>Used with cylinder(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>at 50/60 Hz</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

▼ 4/3 Closed center
24 VDC @ 1.13 A  VP-11  1x Dbl-act. / 2x Sgl-act.
110 VAC @ 500 mA VP-12  1x Dbl-act. / 2x Sgl-act.

▼ 4/3 Float center
24 VDC @ 1.13 A  VP-21  1x Dbl-act. / 2x Sgl-act.
110 VAC @ 500 mA VP-22  1x Dbl-act. / 2x Sgl-act.

▼ 3/2 Normally closed
24 VDC @ 1.13 A  VP-31  1x Dbl-act. / 2x Sgl-act.
110 VAC @ 500 mA VP-32  1x Dbl-act. / 2x Sgl-act.

▼ 3/2 Normally open
24 VDC @ 1.13 A  VP-41  1x Dbl-act. / 2x Sgl-act.
110 VAC @ 500 mA VP-42  1x Dbl-act. / 2x Sgl-act.

▼ 3/2 1 port normally closed, 1 port normally open
24 VDC @ 1.13 A  VP-51  1x Dbl-act. / 2x Sgl-act.
110 VAC @ 500 mA VP-52  1x Dbl-act. / 2x Sgl-act.

Note: DIN 43650 electrical connector included. Valve weight 6.5 lbs (3.0 kg.).
**Pressure switches, Flow control valve**

**PSCK, VFC-series**

- **Pressure**: 5000 psi
- **Flow**: 427 in³/min @ 5000 psi
- **Voltage**: 115 VAC, 24 VDC

**To control your hydraulic system**

- Mounts directly into VP-series modular valves
- In-line installation
- Cartridge type flow control valve and pressure switches can be manifold mounted for remote use
- Lockable adjustment screw on PSCK models

**Options**

- **PB-1 Auxiliary block**
- **Pressure reducing valves**

**Pressure switches, Flow control valve**

- **PSCK-8, 9**
- **VFC-3**

**Application**

- Adjustable pressure switches will open or close electrical contacts when the desired pressure value is reached.

**VFC-3**

- Screw-in throttle type valve to control the amount of oil flow to the hydraulic cylinder.

**Product selection**

<table>
<thead>
<tr>
<th>Solenoid voltage @ current</th>
<th>Model number</th>
<th>Hydraulic scheme</th>
<th>Pressure range</th>
<th>Deadband</th>
<th>Maximum oil flow</th>
</tr>
</thead>
<tbody>
<tr>
<td>at 50/60 Hz</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>▼ Pressure switch</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>24 VDC @ 2 A</td>
<td>PSCK-8</td>
<td></td>
<td>1450 - 5000</td>
<td>261 - 501</td>
<td>427</td>
</tr>
<tr>
<td>115 VAC @ 2 A</td>
<td>PSCK-8</td>
<td></td>
<td>290 - 3045</td>
<td>87 - 218</td>
<td>427</td>
</tr>
<tr>
<td>▼ Pressure switch</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>24 VDC @ 2 A</td>
<td>PSCK-9</td>
<td></td>
<td>290 - 3045</td>
<td>87 - 218</td>
<td>427</td>
</tr>
<tr>
<td>115 VAC @ 2 A</td>
<td>PSCK-9</td>
<td></td>
<td>290 - 3045</td>
<td>87 - 218</td>
<td>427</td>
</tr>
<tr>
<td>▼ Flow control valve</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>screw-in</td>
<td>VFC-3</td>
<td></td>
<td>0-5000</td>
<td>–</td>
<td>427</td>
</tr>
</tbody>
</table>

**Shown: PSCK-8, VFC-3**

Adjustable pressure switches will open or close electrical contacts when the desired pressure value is reached.

**Application**

To open or close an electric circuit when a preset pressure value is reached. The electrical circuit is used to control further working cycles, such as actuating control valves or to terminate a working cycle. Directly mounted into Enerpac VP-series valves.

**VFC-3**

Screw-in throttle type valve to control the amount of oil flow to the hydraulic cylinder.

**Application**

Used to control cylinder speed in hydraulic circuits. Directly mounted into Enerpac VP-series valves or custom made manifolds for remote applications.

**PSCK-8 and VFC-3 directly mounted on VP-valves.**
Pressure reducing valves

Precise control of hydraulic pressure

- Stackbuilding with VP series modular valves
- Stackable for multiple pressures on one valve stack assembly
- Tool adjustable knob can be locked
- Precise control of pressure

PRV series

These valves regulates system pressure for all subsequent valves, according to the adjusted pressure. Maintains a constant pressure in a secondary circuit. Includes a check valve that prevents pressure drop on secondary side.

Application

Used when a hydraulic supply with a higher pressure (primary side) must also be used for another circuit with a lower pressure (secondary circuit). PRV-1 can be stack built between VP-series valves.

Options

- Pressure switches
- Tie rod kits

Product selection

<table>
<thead>
<tr>
<th>Mounting style</th>
<th>Adjustable pressure range</th>
<th>Maximum pressure</th>
<th>Model number</th>
<th>Oil ports</th>
<th>Maximum oil flow</th>
</tr>
</thead>
<tbody>
<tr>
<td>VP-series</td>
<td>435 - 4350 psi</td>
<td>5000 psi</td>
<td>PRV-1</td>
<td>G1/4&quot;</td>
<td>427 in³/min</td>
</tr>
<tr>
<td>VP-series</td>
<td>75 - 2000 psi</td>
<td>5000 psi</td>
<td>PRV-5</td>
<td>G1/4&quot;</td>
<td>427 in³/min</td>
</tr>
</tbody>
</table>
Tie rod kits, Remote/porting manifolds

Simplifies valve and accessory mounting

**TRK-series tie rods**
- Connects 1 to 8 VP-series valves station high
- Provide leak-free sealing valves
- G1/4" oil connection

**WM-10 remote manifold**
- Allows remote VP-series valve mounting
- Adjustable relief valve incorporated
- G1/4" oil connection

**PB-1 porting manifold**
- Provide 3 auxiliary pressure lines
- G1/4" oil connection

---

**Options**

- Pressure switches
- VP-series directional valves
- Gauges

---

**Product selection**

<table>
<thead>
<tr>
<th>Quantity of stackable VP-series directional valves</th>
<th>Tie rod number</th>
<th>Tie rod length A</th>
<th>Mounting thread</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Tie rod kits</td>
<td>TRK-1</td>
<td>3.45 M6</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>TRK-2</td>
<td>4.92 M6</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>TRK-3</td>
<td>6.50 M6</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>TRK-4</td>
<td>8.07 M6</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>TRK-5</td>
<td>9.65 M6</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>TRK-6</td>
<td>11.22 M6</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>TRK-7</td>
<td>12.80 M6</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>TRK-8</td>
<td>14.37 M6</td>
<td></td>
</tr>
</tbody>
</table>

---

**Product selection**

<table>
<thead>
<tr>
<th>Oil ports</th>
<th>Model number</th>
<th>Hydr. schematic</th>
<th>Maximum pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>2x G1/4&quot;</td>
<td>WM-10</td>
<td></td>
<td>5000</td>
</tr>
<tr>
<td>3x G1/4&quot;</td>
<td>PB-1</td>
<td></td>
<td>5000</td>
</tr>
</tbody>
</table>

---

**TRK-series**

Tie Rod Kits mount Enerpac VP-series modular valves to the WM-10 manifold and can accommodate one to eight VP-valve stations.

**WM-10**

Remote manifold allows mounting of VP-series modular valves to a remote location from the pumping unit. This manifold has a built-in adjustable relief valve.

**PB-1**

Porting manifold provides three pressure ports for auxiliary lines or accessories, such as a pressure gauge. Mounts between VP-series modular valve stations using TRK-series tie rod kits.

---

© 2008 ENERPAC 125
Zero leakage poppet valves increase efficiency

- Poppet valve design for zero leakage
- 4-way, 2-position float offset or normally open
- DO3 mounting pattern
- DIN-standard rectifier plugs for easy connection to power source
- Air operated models eliminate need for electricity
- Including O-rings and mounting bolts
- SAE manifold ports simplify plumbing
- Inline check valve provides positive load holding

**Application**

Advance and retract for single- and double-acting cylinders. The valves require check valves for positive load holding and can be installed for the same independent operation with single-acting cylinders by blocking the B port.

**Options**

- DO3 Manifolds MB-series
- Fittings

**Important**

For multiple circuit applications, the VD1P inline check valve is recommended to prevent pressure drop on the holding circuit. Order bolt kit F107028-5 to mount VD1P with VMMD.

**Product selection**

<table>
<thead>
<tr>
<th>Valve flow path</th>
<th>Solenoid voltage @ current</th>
<th>Model number</th>
<th>Hydr. symbol</th>
<th>Pressure range</th>
<th>Pressure drop</th>
<th>Max. oil flow</th>
</tr>
</thead>
<tbody>
<tr>
<td>4-way, 2 position 60-100 psi max.</td>
<td>VAS-0710D</td>
<td>A B</td>
<td>0-5000</td>
<td>180</td>
<td>690</td>
<td></td>
</tr>
<tr>
<td>4-way, 2 position 24VDC @ 1.60 A</td>
<td>VAS-1410D</td>
<td>A B</td>
<td>0-5000</td>
<td>180</td>
<td>690</td>
<td></td>
</tr>
<tr>
<td>4-way, 2 position 115VAC @ .40 A</td>
<td>VAS-2210D</td>
<td>A B</td>
<td>0-5000</td>
<td>180</td>
<td>690</td>
<td></td>
</tr>
<tr>
<td>4-way, 2 position 60-100 psi max.</td>
<td>VAT-0710D</td>
<td>A B</td>
<td>0-5000</td>
<td>180</td>
<td>690</td>
<td></td>
</tr>
<tr>
<td>4-way, 2 position 24VDC @ 1.60 A</td>
<td>VAT-1410D</td>
<td>A B</td>
<td>0-5000</td>
<td>180</td>
<td>690</td>
<td></td>
</tr>
<tr>
<td>4-way, 2 position 115VAC @ .40 A</td>
<td>VAT-2210D</td>
<td>A B</td>
<td>0-5000</td>
<td>180</td>
<td>690</td>
<td></td>
</tr>
<tr>
<td>Inline check valve</td>
<td>VD1P</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0-5000</td>
</tr>
</tbody>
</table>

© 2008 www.enerpac.com
Manual control of single and double-acting cylinders

- Near zero leakage pressure seal design
- 4-way, 3-position
- Detented handle positions
- Low handle effort 12 lbs, even at full pressure
- Handle can be repositioned for side by side valve mounting
- Compact size for directly mounting on fixture for individual circuit control

Options

VD1P, Inline check valve

DO3 Manifolds

Hoses and couplers

Fittings

Important

For multiple circuit applications, the VD1P inline check valve is recommended to prevent pressure drop on the holding circuit. Order bolt kit F107028-13 to mount VD1P with VMMD.

Pressure on return side (tank) should not exceed 250 psi.

Product selection

<table>
<thead>
<tr>
<th>Valve mounting pattern</th>
<th>Mounting bolts included</th>
<th>Oil ports</th>
<th>Model number</th>
<th>Hydraulic symbol</th>
<th>Pressure range</th>
<th>Pressure drop</th>
<th>Max. oil flow</th>
</tr>
</thead>
<tbody>
<tr>
<td>Panel mtg.</td>
<td>-</td>
<td>SAE #4</td>
<td>VMTD-001</td>
<td>B</td>
<td>0-5000</td>
<td>70</td>
<td>1040</td>
</tr>
<tr>
<td>DO3</td>
<td>#10-24UNC</td>
<td>-</td>
<td>VMMD-001</td>
<td>B</td>
<td>0-5000</td>
<td>70</td>
<td>1040</td>
</tr>
<tr>
<td>Panel mtg.</td>
<td>-</td>
<td>SAE #4</td>
<td>VMTD-003</td>
<td>B</td>
<td>0-5000</td>
<td>70</td>
<td>1040</td>
</tr>
<tr>
<td>DO3</td>
<td>#10-24UNC</td>
<td>-</td>
<td>VMMD-003</td>
<td>B</td>
<td>0-5000</td>
<td>70</td>
<td>1040</td>
</tr>
</tbody>
</table>

1) Pressure drop from P-A or P-B at maximum oil flow of 1040 in³/min.

Seal material: Buna-N, Polyurethane.

© 2008
DO3 Direction Valve and accessories

- DO3 mounting pattern
- Directional valves
- Pilot operated check valve
- Dual flow control
- Pressure reducing valve

**Product selection**

<table>
<thead>
<tr>
<th>Valve flow path</th>
<th>Solenoid voltage 50/60 hz</th>
<th>Model number</th>
<th>Hydraulic symbol</th>
<th>Pressure range psi</th>
<th>Pressure range psig</th>
<th>Maximum gpm</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-position/4 way</td>
<td>24 VDC</td>
<td>VEW-11</td>
<td></td>
<td>0-5000</td>
<td>125</td>
<td>8</td>
</tr>
<tr>
<td>3-position/4 way</td>
<td>24 VDC</td>
<td>VET-11</td>
<td></td>
<td>0-5000</td>
<td>150</td>
<td>8</td>
</tr>
<tr>
<td>Closed center</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3-position/4 way</td>
<td>24 VDC</td>
<td>VEX-11</td>
<td></td>
<td>0-5000</td>
<td>165</td>
<td>8</td>
</tr>
<tr>
<td>Float center</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dual flow control</td>
<td></td>
<td>VFC-4</td>
<td></td>
<td>0-5000</td>
<td>–</td>
<td>10</td>
</tr>
<tr>
<td>Dual pilot operated</td>
<td></td>
<td>VD2P</td>
<td></td>
<td>0-5000</td>
<td>200</td>
<td>15</td>
</tr>
<tr>
<td>check valve</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pressure reducing valve</td>
<td></td>
<td>PRV-6</td>
<td></td>
<td>0-5000</td>
<td>–</td>
<td>3</td>
</tr>
</tbody>
</table>

**Important**

To hold the pressure in a clamping circuit, use the VEX11 valve with the VD2P check module. Do not use DO3 spool valves with pressure shutdown pumps.
When independent control of multiple cylinders is required

- Multi-station manifolds with SAE porting – minimizes plumbing
- Mounting pattern for DO3 valves and Enerpac VSS and VST Positive Seal Control Valves and VMMD manual valves
- Manifolds allow use of accessories, such as pressure switches and gauges

Options

- VSS, VST, VMMD-series valves
- Pressure switches
- Gauges
- Fittings

Important

Use MC-1 cover plates to seal non-used manifold stations.

Product selection

<table>
<thead>
<tr>
<th>Valve mounting pattern</th>
<th>Amount of valve stations</th>
<th>Model number</th>
<th>Oil ports cover plate</th>
<th>Optional length model number*</th>
<th>Manifold in lbs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Single station manifold</td>
<td>1</td>
<td>MB-1</td>
<td>SAE #4</td>
<td>–</td>
<td>–</td>
</tr>
<tr>
<td>DO3, Enerpac VSS, VST valves</td>
<td>1</td>
<td>MB-1</td>
<td>SAE #4</td>
<td>–</td>
<td>–</td>
</tr>
</tbody>
</table>

*Note: - MC-1 manifold cover plate must be ordered separately. Includes gasket and mounting bolts.
Unmatched combination of possibilities

- Shear seal design minimizes internal leakage
- Relief valve and pilot-operated check accessory valves are stackable eliminating external plumbing
- Remote and pump mounting
- Mounting bolts included with each modular valve

Select the required valve flow path

<table>
<thead>
<tr>
<th>Valve flow path</th>
<th>For cylinder</th>
<th>Valve code</th>
<th>Hydraulic symbol</th>
</tr>
</thead>
<tbody>
<tr>
<td>▼ 2-way, 2-position (2/2)</td>
<td>Normally closed</td>
<td>Unloading *</td>
<td>VEH</td>
</tr>
<tr>
<td></td>
<td>Normally open</td>
<td>Unloading *</td>
<td>VEK</td>
</tr>
<tr>
<td>▼ 3-way, 2-position (3/2)</td>
<td>Normally open</td>
<td>Single-acting</td>
<td>VEP</td>
</tr>
<tr>
<td>▼ 3-way, 3-position (3/3)</td>
<td>Tandem center</td>
<td>Single-acting</td>
<td>VEF</td>
</tr>
<tr>
<td></td>
<td>Closed center</td>
<td>Single-acting</td>
<td>VEG</td>
</tr>
<tr>
<td>▼ 4-way, 2-position (4/2)</td>
<td>Crossover offset</td>
<td>Double-acting</td>
<td>VEE</td>
</tr>
<tr>
<td></td>
<td>Float offset</td>
<td>Double-acting</td>
<td>VEM</td>
</tr>
<tr>
<td>▼ 4-way, 3-position (4/3)</td>
<td>Open center</td>
<td>Double-acting</td>
<td>VEA</td>
</tr>
<tr>
<td></td>
<td>Closed center</td>
<td>Double-acting</td>
<td>VEB</td>
</tr>
<tr>
<td></td>
<td>Tandem center</td>
<td>Double-acting</td>
<td>VEC</td>
</tr>
<tr>
<td></td>
<td>Float center</td>
<td>Double-acting</td>
<td>VED</td>
</tr>
</tbody>
</table>

* VEH and VEK valve models require the use of tank port for dump or unloading.

Product specifications

<table>
<thead>
<tr>
<th>Pressure range (psi)</th>
<th>Maximum oil flow (in³/min)</th>
<th>Voltage @ Hz</th>
<th>Amperage draw</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-10,000</td>
<td>920</td>
<td>24 VDC @ 50/60 Hz</td>
<td>– 2.5</td>
</tr>
<tr>
<td>0-10,000</td>
<td>920</td>
<td>115 VAC @ 60 Hz</td>
<td>3.6 1.0</td>
</tr>
<tr>
<td>0-10,000</td>
<td>920</td>
<td>220/240 VAC @ 50 Hz</td>
<td>1.3/1.4 .45/.53</td>
</tr>
<tr>
<td>0-10,000</td>
<td>920</td>
<td>230 VAC @ 60 Hz</td>
<td>1.8  .50 A</td>
</tr>
</tbody>
</table>

Note: Seal material: Buna-N, Polyurethane.
DIN43650 Valve plug included on remote mounted valves.

VE-series
Solenoid modular valves are especially well suited for workholding and production applications. With 11 possible flowpaths and 2 manifolds, for either Enerpac’s submerged pump or a remote NPT mount, you can “custom build” a valve for almost any application.

Application
Ideal when mounted on remote manifold for applications where independent control of multiple cylinders is required.
Custom build your modular valves

This is how a Solenoid Modular Valve Model Number is built up:

<table>
<thead>
<tr>
<th>VEA</th>
<th>1</th>
<th>5</th>
<th>600</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Modular valve code</td>
<td>2 Flow capacity</td>
<td>3 Voltage</td>
<td>4 Accessory Valves</td>
<td>5 Manifold</td>
</tr>
<tr>
<td>1 Oil flow capacity</td>
<td>1 = 920 in³ per minute</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 Solenoid voltage</td>
<td>1 = 24 VDC, 50 / 60 Hz</td>
<td>2 = 230 V, 1 ph, 50 Hz</td>
<td>5 = 230 V, 1 ph, 60 Hz</td>
<td></td>
</tr>
<tr>
<td>4 Accessory valves</td>
<td>000 = No accessory valves</td>
<td>100 = VS-11 Relief valve only</td>
<td>150 = VS-11 Relief valve and VS-51 3-way pilot operated check valve VEF/VEG only</td>
<td>160 = VS-11 Relief valve and VS-61 4-way pilot operated check valve VEA/VEB/VEC/VED only</td>
</tr>
<tr>
<td>5 Manifold</td>
<td>A = No manifold</td>
<td>B = Remote mounted manifold</td>
<td>D = Pump mounted manifold VEA/VEC/VEF only</td>
<td></td>
</tr>
</tbody>
</table>

Example

The VEA-15600-D is a modular valve with a 4-way, 3-position open center flowpath, 115 VAC, and an integrated pilot-operated check valve, for mounting on an Enerpac pump. Bolt Kit BK-2 is included.

VE series

Modular Valve

Pump Mounted

Relief Valve

Position 0

Gauge port

1/4”-18NPT

38

2.08

3.48

1.15

75

38

3.50

1.12

2.46

4.74

Tank port

3/8”-18NPT

3.00

2.09

3.50

6.40

3/8”-18NPT (2x)

27.9-28.8

4.00

3.50

3.50

1.75

1.75

82

1.98

5.39

1.15

82

1.98

Enerpac modular valves

Modular Valve

Remote Mounted

Pressure: 0-10,000 psi

Flow max.: 920 in³/min

Voltage: 24, 115, 230 V

E Válvulas de control

F Electro distributeurs

D Wegesitzventile

Options

Gauges and accessories

Fittings

Accessory Valves and Bolt Kits

Use VS-11 relief valve to add system pressure control to VE-series valves.

Use VS-51 3-way pilot operated check valve to convert 3-way VE-valve into load-holding valve.

Use VS-61 4-way pilot operated check valve to convert 4-way VE-valve into load-holding valve.

To install accessory valves to stack build modular valves use bolt kits:

BK-2 for 1 VS valve;

BK-3 for 2 VS valves.

VE series

Modular Valve

Pump Mounted

Relief Valve

Position 0

Gauge port

1/4”-18NPT

38

2.08

3.48

1.15

75

38

3.50

1.12

2.46

4.74

Tank port

3/8”-18NPT

3.00

2.09

3.50

6.40

3/8”-18NPT (2x)

27.9-28.8

4.00

3.50

3.50

1.75

1.75

82

1.98

5.39

1.15

82

1.98

© 2008

131
Reliable control of single-acting cylinders

- Directional control valves provide advance/hold/retract operation for use with single-acting cylinders
- Remote or pump mounting on most Enerpac pumps
- Return line kit included with remote valves
- Available “locking” option on VC and VM-series valves for load-holding applications

Select the required center position

Non-locking
- Use in simple clamping circuits. Has interflow between ports when shifted.

Closed center
- For multiple valve and cylinder operation. All ports blocked in the center position.

Locking center
- For positive load holding without loss of pressure. Cylinder travel can only resume by shifting valve from hold position.

Tandem center
- For one or multiple cylinder operation. Pump flow is directed back to tank in the center position.

Product selection

<table>
<thead>
<tr>
<th>Valve type</th>
<th>Valve mounting location</th>
<th>Model number</th>
<th>Hydraulic symbol</th>
</tr>
</thead>
<tbody>
<tr>
<td>▼ Manual 3-way, 2-position (3/2)</td>
<td>Pump</td>
<td>VM-2</td>
<td></td>
</tr>
<tr>
<td>▼ Manual 3-way, 3-position (3/3)</td>
<td>Tandem center Pump</td>
<td>VM-3</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Tandem center Remote</td>
<td>VC-3</td>
<td></td>
</tr>
<tr>
<td>▼ Manual 3-way, 3-position (3/3)</td>
<td>Tandem center, locking</td>
<td>VM-3L</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Tandem center, locking</td>
<td>VC-3L</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Closed center Remote</td>
<td>VC-15</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Closed center, locking</td>
<td>VC-15L</td>
<td></td>
</tr>
</tbody>
</table>

Four VC-15 Enerpac manual valves mounted on fixture to give independent control of several hydraulic circuits.

Shown: VM-2, VM-3
**Dimensions & options**  
**V-series**

- **Pressure:** 0-10,000 psi
- **Flow max.:** 1040 in³/min

**Options**

- **Gauges and accessories**
- **Hoses and couplers**
- **Fittings**

**Important**

- **Locking Valves**
  For applications that require positive load holding, most VM and VC valves are available with pilot operated check valve. This option provides hydraulic locking of the load until valve is shifted into retract position. To order this feature, place an “L” at the end of the model number.

**Valving help**
See Basic System Set-up and Valve information in our “Yellow Pages”.

---

### Product specifications

<table>
<thead>
<tr>
<th>Model number</th>
<th>Pressure range</th>
<th>Used for cylinder</th>
<th>Schematic flowpath</th>
<th>Advance</th>
<th>Hold</th>
<th>Retract</th>
</tr>
</thead>
<tbody>
<tr>
<td>VM-2</td>
<td>0-10,000 psi</td>
<td>Single-acting</td>
<td></td>
<td></td>
<td></td>
<td>4.8 lbs</td>
</tr>
<tr>
<td>VM-3L (only)</td>
<td>0-10,000 psi</td>
<td>Single-acting</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VC-3L (only)</td>
<td>0-10,000 psi</td>
<td>Single-acting</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

1. VM-3L only  
2. VC-3L and VC-15L only
4-way directional manual control valves  Application & selection

**Reliable control of double-acting cylinders**

- Directional control valves provide advance/hold/retract operation for use with double-acting or two single-acting cylinders
- Remote or pump mounting on most Enerpac pumps
- Return line kit included with remote valves
- Available “locking” option on VC and VM-series valves for load-holding applications

**Select the required center position**

<table>
<thead>
<tr>
<th>Non-locking</th>
<th>Closed center</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Use in simple clamping circuits. Has interflow between ports when shifted.</td>
<td>- For multiple valve and cylinder operation. All ports blocked in the center position.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Locking center</th>
<th>Tandem center</th>
</tr>
</thead>
<tbody>
<tr>
<td>- For positive load holding without loss of pressure. Cylinder travel can only resume by shifting valve from hold position.</td>
<td>- For one or multiple cylinder operation. Pump flow is directed back to tank in the center position.</td>
</tr>
</tbody>
</table>

**Product selection**

<table>
<thead>
<tr>
<th>Valve type</th>
<th>Valve mounting location</th>
<th>Model number</th>
<th>Hydraulic symbol</th>
</tr>
</thead>
<tbody>
<tr>
<td>▼ Manual 3-way, 2-position (3/2)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tandem center</td>
<td>Pump</td>
<td>VM-4</td>
<td></td>
</tr>
<tr>
<td>Tandem center</td>
<td>Remote</td>
<td>VC-4</td>
<td></td>
</tr>
<tr>
<td>Tandem center, locking</td>
<td>Pump</td>
<td>VM-4L</td>
<td></td>
</tr>
<tr>
<td>Tandem center, locking</td>
<td>Remote</td>
<td>VC-4L</td>
<td></td>
</tr>
<tr>
<td>Closed center</td>
<td>Remote</td>
<td>VC-20</td>
<td></td>
</tr>
<tr>
<td>Closed center, locking</td>
<td>Remote</td>
<td>VC-20L</td>
<td></td>
</tr>
</tbody>
</table>

**V-series**

Manual operated 4-way, 3-position directional control valves for operation of double-acting or two single-acting cylinders. Remote mount valves include return line kit for connecting the valves to pump reservoir.

**Application**

Pump mounted valves provide centralized control of pump output for cylinder cycling. Remote mounted at any convenient point along the system where control of cylinders is needed.
Product specifications

<table>
<thead>
<tr>
<th>Model number</th>
<th>Pressure range</th>
<th>Used for cylinder</th>
<th>Schematic flowpath</th>
<th>Advance</th>
<th>Hold</th>
<th>Retract</th>
<th>lbs</th>
</tr>
</thead>
<tbody>
<tr>
<td>VM-4</td>
<td>0-10,000</td>
<td>Double-acting</td>
<td>A</td>
<td>4.6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VC-4</td>
<td>0-10,000</td>
<td>Double-acting</td>
<td>B</td>
<td>6.4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VM-4L</td>
<td>0-10,000</td>
<td>Double-acting</td>
<td>C</td>
<td>8.6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VC-4L</td>
<td>0-10,000</td>
<td>Double-acting</td>
<td>D</td>
<td>10.3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VC-20</td>
<td>0-10,000</td>
<td>Double-acting</td>
<td>E</td>
<td>6.4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VC-20L</td>
<td>0-10,000</td>
<td>Double-acting</td>
<td>F</td>
<td>10.3</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Options

Gauges and accessories

Hoses and couplers

Fittings

Important

Locking Valves

For applications that require positive load holding, most VM and VC valves are available with pilot operated check valve. This option provides hydraulic locking of the load until valve is shifted into retract position. To order this feature, place an “L” at the end of the model number.
Sequence valves

Sequence valves block the oil to a secondary hydraulic circuit until pressure in the primary circuit reaches a preset level. The sequence valves have a built-in check system to allow the oil to flow back without external piping.

Pressure settings for the V-2000 can be adjusted by screwing the slotted pin in or out. The pressure settings for the other models is adjusted by loosening the jam nut and turn the set screw to reach your setting.

Application

The sequence valves can be mounted in-line or fixture mounted using mounting bolts.

A typical application for the sequence valve would be to build pressure within work supports before the swing cylinders are applied to the supported part, to prevent deflection in the part.

Two WVP-5 sequence valves used in conjunction with Enerpac WCA-series Auto Coupler to provide system automation.

Pressure dependent sequence control

**MVPM-5, WVP-5**

- Direct accurate pressure setting
- Pressure setting between 500-5000 psi for secondary circuit is secured with lock nut
- Mounting holes on WVP-5, manifold mounting ports on MVPM-5

**V-2000**

- Direct accurate pressure setting
- Pressure setting between 200-2000 psi for secondary circuit
- Flag indicator appears everytime the valve is operated

**Product selection**

<table>
<thead>
<tr>
<th>Pressure adjustment range</th>
<th>Maximum pressure</th>
<th>Maximum oil flow</th>
<th>Model number</th>
<th>Oil ports</th>
<th>Opening pressure check valve</th>
</tr>
</thead>
<tbody>
<tr>
<td>psi</td>
<td>psi</td>
<td>in³/min</td>
<td></td>
<td>psi</td>
<td>lbs</td>
</tr>
<tr>
<td>500-5000</td>
<td>5000</td>
<td>366</td>
<td>MVPM-5</td>
<td>G 1/4“</td>
<td>20</td>
</tr>
<tr>
<td>500-5000</td>
<td>5000</td>
<td>366</td>
<td>WVP-5</td>
<td>SAE #4</td>
<td>20</td>
</tr>
</tbody>
</table>

Seal material: Buna-N.

Manifold O-rings included with MVPM-5. For manifold mounting installation information consult Enerpac for surface preparation.
Pilot operated check valves

For more information on ACL-series Accumulators see page 150.

### Product selection

<table>
<thead>
<tr>
<th>Pilot ratio</th>
<th>Accumulator included</th>
<th>Maximum oil flow</th>
<th>Maximum pressure</th>
<th>Model number</th>
<th>Oil ports</th>
<th>Optional charging tool for ACL</th>
<th>lbs</th>
</tr>
</thead>
<tbody>
<tr>
<td>7:1</td>
<td>–</td>
<td>10 gpm max</td>
<td>5000 psi</td>
<td>V-72</td>
<td>SAE #4</td>
<td>–</td>
<td>4.0</td>
</tr>
<tr>
<td>7:1</td>
<td>ACL-22</td>
<td>10</td>
<td>5000 psi</td>
<td>MV-722B</td>
<td>G 1/4&quot;</td>
<td>WAT-2</td>
<td>6.0</td>
</tr>
<tr>
<td>7:1</td>
<td>ACL-202</td>
<td>10</td>
<td>5000 psi</td>
<td>MV-7202B</td>
<td>G 1/4&quot;</td>
<td>WAT-2</td>
<td>7.5</td>
</tr>
<tr>
<td>7:1</td>
<td>–</td>
<td>10</td>
<td>5000 psi</td>
<td>MVM-72</td>
<td>G 1/4&quot;</td>
<td>–</td>
<td>3.0</td>
</tr>
</tbody>
</table>

For more information on ACL-series Accumulators see page 150.

### Options

**Fittings**

- MV and V-series
  - Pilot operated check valves check the oil flow with a built-in pilot circuit providing fast, automatic check-off for your workholding applications.
  - The pilot operated check valves with built-in accumulator help to maintain system pressure due to minor oil loss.

**Application**

- Added capability to open with pilot pressure to allow cylinders to retract. By using a pilot operated check valve, cylinder retraction can be accomplished automatically without operator activity.

**Seal material:** Buna-N.

**Manifold O-rings included with MVM-72. For manifold mounting installation information consult Enerpac for surface preparation.**

© 2008
Flow control valves

Regulate the flow of oil
- Poppet valve design for zero leakage
- Color coded flow indicator
- Free flow return
- Fine metering capability
- Lockable
- Standard Viton seals

**VFC-series**
Provide repeatable oil flow control. The internal check valve allows metered flow in one direction and free flow in the opposite direction. Precise control is achieved with a micro-meter style adjustment knob, which can be locked with the set screw.

**Application**
Use VFC-series flow control valves in-line with the Enerpac WE-series workholding pump to protect your components from damage due to high flow rates.

**Options**

<table>
<thead>
<tr>
<th>Fittings</th>
</tr>
</thead>
<tbody>
<tr>
<td>![Fittings Image]</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>High pressure filter</th>
</tr>
</thead>
<tbody>
<tr>
<td>![High Pressure Filter Image]</td>
</tr>
</tbody>
</table>

**In-line installation of a VFC-1 flow control valve.**

**Product selection**

<table>
<thead>
<tr>
<th>Maximum oil flow</th>
<th>Pressure range</th>
<th>Oil ports</th>
<th>Model number</th>
<th>Flow path</th>
<th>Maximum pressure drop</th>
</tr>
</thead>
<tbody>
<tr>
<td>gpm</td>
<td>psi</td>
<td></td>
<td></td>
<td></td>
<td>psi</td>
</tr>
<tr>
<td>10</td>
<td>0-5000</td>
<td>SAE #4</td>
<td>VFC-1</td>
<td></td>
<td>1500</td>
</tr>
<tr>
<td>10</td>
<td>0-5000</td>
<td>G 1/4&quot;</td>
<td>VFC-2</td>
<td></td>
<td>1500</td>
</tr>
</tbody>
</table>

Seal material: Viton
Pressure reducing valves

Precise control of hydraulic pressure
- Tool adjustable knob can be locked
- Precise control of pressure
- G1/4" oil connection
- Remote mount

Options

VP-Modular valves

Pressure switches

Tie rod kits

PRV series
These valves regulates system pressure for all subsequent valves, according to the adjusted pressure. Maintains a constant pressure in a secondary circuit. Includes a check valve that prevents pressure drop on secondary side.

Application
Used when a hydraulic supply with a higher pressure (primary side) must also be used for another circuit with a lower pressure (secondary circuit). PRV-3 and 4 are for remote mounting. The cartridge from PRV-3 and 4 can be removed from manifold for direct integration into gundrilled fixture. Order the cartridge separately as PRV-3T or PRV-4T.

Product selection

<table>
<thead>
<tr>
<th>Mounting style</th>
<th>Adjustable pressure range</th>
<th>Maximum pressure</th>
<th>Model number</th>
<th>Oil ports</th>
<th>Maximum oil flow</th>
</tr>
</thead>
<tbody>
<tr>
<td>Remote</td>
<td>435 - 4350 psi</td>
<td>5000</td>
<td>PRV-3</td>
<td>G1/4&quot;</td>
<td>427</td>
</tr>
<tr>
<td>Cartridge</td>
<td>435 - 4350 psi</td>
<td>5000</td>
<td>PRV-3T</td>
<td>–</td>
<td>427</td>
</tr>
<tr>
<td>Remote</td>
<td>75 - 2000 psi</td>
<td>5000</td>
<td>PRV-4</td>
<td>G1/4&quot;</td>
<td>427</td>
</tr>
<tr>
<td>Cartridge</td>
<td>75 - 2000 psi</td>
<td>5000</td>
<td>PRV-4T</td>
<td>–</td>
<td>427</td>
</tr>
</tbody>
</table>
Accessory valves

Accessory valves are available in a wide variety and many configurations to control hydraulic pressure or oil flow. These valves are used in conjunction with other valves and system components to provide full automation and control.

Application

Accessory valves are used to automate clamp cycles, prevent pressure loss and provide additional operator and component safety.

Your hydraulic control solution

- Regulate oil flow or system pressure
- All valves feature NPT or SAE porting to insure against leakage at rated pressure
- Can easily be installed in any system
- All valves are painted, coated or plated for corrosion resistance

Product selection

<table>
<thead>
<tr>
<th>Valve type</th>
<th>Maximum pressure</th>
<th>Model number</th>
<th>Oil ports</th>
</tr>
</thead>
<tbody>
<tr>
<td>Holding valve, air pilot</td>
<td>3000 psi</td>
<td>HV-1000A</td>
<td>1/8&quot; NPT</td>
</tr>
<tr>
<td>Holding valve, modular</td>
<td>3000 psi</td>
<td>MHV-1</td>
<td>1/8&quot; NPT</td>
</tr>
<tr>
<td>Pressure limiting valve</td>
<td>3000 psi</td>
<td>PLV-40013B</td>
<td>1/8&quot; NPT</td>
</tr>
<tr>
<td>Manual shut-off valve</td>
<td>5000 psi</td>
<td>V-12</td>
<td>SAE #4</td>
</tr>
<tr>
<td>Auto-damper valve</td>
<td>10,000 psi</td>
<td>V-10</td>
<td>1/2&quot; NPT</td>
</tr>
<tr>
<td>Safety check valve</td>
<td>10,000 psi</td>
<td>V-17</td>
<td>3/8&quot; NPT</td>
</tr>
<tr>
<td>Pressure relief valve</td>
<td>10,000 psi</td>
<td>V-152</td>
<td>3/8&quot; NPT</td>
</tr>
</tbody>
</table>

Product specification

**HV-1000A**

Air pilot holding valve

- Holds fluid under pressure offering independent control of different branches of the same fixture
- Valve can control the pilot air and the booster in sequence
- Max. oil flow 305 in³/min
- Works with the VA-42 four-way air valve and a booster

**MHV-1**

Modular holding valve

- Allows separate operation of clamping fixtures with a single power source
- Ideal for applications when fluid feed lines are impractical. If system pressure is interrupted, the MHV-1 will hold the pressure beyond the valve
- Max. oil flow 305 in³/min
- To release system pressure, rotate valve handle in either direction 90° to release and retract system pressure
PLV-40013B
Pressure limiting valve
- Allows precise control of pressures reaching specific clamps
- When pressure build-up reaches a preset level, the valve closes, stabilizing pressure to that section of the fixture
- Pressure adjustment between 200 to 1500 psi
- Max. oil flow 305 in³/min

V-12
Manual shut-off valve
- Ball type valve can be used for the master system shut-off or for isolating separate circuits on a fixture
- Viton seals standard
- Straight through design for easy system plumbing and installation
- Fully open allows high flow return of oil
- Max. oil flow 732 in³/min

V-10 Auto-damper valve
- To protect gauge during high cycle applications
- Creates a flow resistance when load is released suddenly
  No adjustments are necessary
- Fits directly into GA-series gauge adaptor

V-17 Safety check valve
- Ruggedly built to resist shock and operate with low pressure drop
- Closes smoothly without pounding
- Max. oil flow 1830 in³/min

V-152 Pressure relief valve
- Limits pressure developed by the pump in hydraulic circuit, thus limiting the force imposed on other components
- 800-10,000 psi adjustment range; ± 3% repeatability
- Valve opens whenever preset pressure is reached. To increase pressure setting, turn handle clockwise
- Max. oil flow 1830 in³/min
- Includes 3 ft. return line hose kit

Options
- VA-42 Air valve
- Gauges and adaptors
- Hoses and couplers
- Fittings

Important
Valving help
See Basic System Set-up and Valve information in our “Yellow Pages”.
Air valves and accessories

To control and regulate air supply

**VA-42 Manual operated air valve**
*5-way, 2-position*
- For control of boosters
- Viton seals standard

**VAS-42 Solenoid operated air valve**
*5-way, 2-position*
- For control of pump and boosters air supply
- Viton seals standard
- Solenoid: 120 VAC, 50/60Hz
  Amperage: inrush .11 Amps, holding .07 Amps
- Maximum cycle rate: 600 cycles per minute

**VR-3 Rapid exhaust valve**
- Enables booster to advance and retract faster
- Instantly exhaust air supply from booster to atmosphere

**V-19 Air check valve**
- Prevent rapid drop of air pressure to the booster in the event of sudden loss of input air

**RFL-102 Regulator-Filter-Lubricator**
- Regulates air pressure
- Filter air input
- Lubricates air motors with a fine oil vapor mist
- Maximum air flow 48 scfm

---

**Air valves**
Enerpac’s line of directional air valves and accessories complete your workholding system. Used to control air operated hydraulic units, they increase your productivity and efficiency.

**Application**
VA-series directional air valves provide either manual or electric control to air operated hydraulic units. Accessories such as rapid exhaust, check valves, silencers and regulators complete the air control system.

- Accessory valves provide greater safety and more efficient clamping cycles
- Recommended for use with all air powered units
- Directional valves to control booster and pump air supply
- Remote air valve permits either hand or foot operation

---

**Product selection**

<table>
<thead>
<tr>
<th>Maximum pressure psi</th>
<th>Model number</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Air valves</strong></td>
<td></td>
</tr>
<tr>
<td>30-150</td>
<td>VA-42</td>
</tr>
<tr>
<td>30-150</td>
<td>VAS-42</td>
</tr>
<tr>
<td>0-100</td>
<td>VR-3</td>
</tr>
<tr>
<td>0-100</td>
<td>V-19</td>
</tr>
<tr>
<td><strong>Accessories</strong></td>
<td></td>
</tr>
<tr>
<td>0-125</td>
<td>RFL-102</td>
</tr>
</tbody>
</table>

---

**Important**
Valving help
See Basic System Set-up and Valve information in our “Yellow Pages”.  

---

**Options**

- **Gauges and adaptors**
- **Hoses and couplers**
- **Fittings**
Valve Cutaways

WVP-5
The opening point is set by the adjustment spring. Incoming pressure is blocked by the valve spindle in the orifice plate. When opening pressure is reached, the spindle is pushed up until fluid will pass. The system pressure level is maintained as pressure builds in the downstream circuit. Reverse flow is through a reverse check valve.

V-72
System pressure enters through the "Pump" port, flows through the check seat and past the check valve into the cylinder circuit. When system pressure drops, the check ball closes off the seat, blocking flow. To release the cylinder pressure, the "Pilot" port is pressurized, and the pilot piston pushes the check ball off of the seat, allowing reverse flow.

PRV-3
A check ball is held off of the check seat by a spring loaded spindle. The spring setting determines the closing point of the valve. As pressure builds in the cylinder side of the circuit, the spindle is lifted, and the check seats. Closing off further flow through the valve provides a reduced pressure to the cylinder.